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Advance fossil-fuel processing operations, including oil-shale retorting, coal gasification, coal liquifaction and tar-sands recovery, can result in chemically complex aqueous waste effluents. This bibliography compiles much of the recent literature (including 1979) concerning effects of organic compounds in advanced fossil-fuel processing effluents when discharged into aquatic ecosystems, plus information available on analytical methods and treatment technologies for these organics. To compile the bibliography, nearly 500 organic compounds known to be constituents of fossil fuels and fossil-fuel processing effluents were crossed with a list of key words during a computerized search. The bibliography contains 1135 citations which are indexed by chemicals, key words, taxonomic categories and authors.

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FOREWORD

Our nation is confronting a mandate to develop synthetic fuels from coal and oil shale to reduce dependence on foreign oil supplies and find a substitute for decreasing natural gas reserves. Achieving the level of synthetic-fuel production necessary to significantly contribute to U.S. energy supplies requires establishment of many facilities devoted to coal gasification, coal liquifaction, and oil-shale retorting. Each of these technologies produce complex waste waters containing numerous organic contaminants, many present in high concentrations. Few of these organic constituents have been studied adequately to determine potential effects in aquatic environments or possible routes of exposure to man and subsequent effects on human health.

As an aid to research scientists and others concerned with environmental and health effects associated with synfuels development, this indexed bibliography compiles many of the citations for the literature published between 1970 and 1979 pertaining to aquatic ecosystem effects, analytical methods and waste treatment technologies for many organic compounds in effluents from advanced fossil-fuel technologies. This bibliography not only identifies literature pertaining to individual organic constituents but also identifies many constituents for which little or no published information exists. This will aid investigators in selecting those compounds where additional research is required while also avoiding unnecessary duplication of research on those compounds for which adequate data exist.

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Duluth, Minnesota

ABSTRACT

Advanced fossil-fuel processing operations, including oil-shale retorting, coal gasification, coal liquifaction and tar-sands recovery, can result in chemically complex aqueous waste effluents. This bibliography expands and updates an earlier volume published in February 1980 by the U.S. EPA (Research and Development Series Report EPA-600/3-80-026) and compiles 1135 additional citations concerning effects of organic compounds in advanced fossil-fuel processing effluents when discharged into aquatic ecosystems. Also included is information on available analytical methods and treatment technologies for these organics. Citations are indexed by chemicals, keywords, taxonomic categories and authors. The bibliography is intended especially for researchers working with advanced fossil-fuel processing effluents in aquatic environments, but should also be useful to those concerned with fossil-fuel processing effluents in other environments and to those working with other aqueous effluents containing organic compounds.

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We welcome any comments and suggestions from users of this bibliography to aid us in improving subsequent updates.

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INTRODUCTION

The accelerating development of the United States' energy resources to relieve national dependence on foreign petroleum imports poses potentially adverse environmental impacts. Synthetic fuels processing technologies, including oil-shale retorting, coal gasification, coal liquefaction and tar-sands recovery, produce aqueous waste by-products. In these aqueous wastes are dissolved a diversity of complex organic compounds. While many compounds are common to all such wastes, the exact composition is dependent upon both the processing technology and the fossil-fuel deposit involved. Release of these wastewaters to aquatic ecosystems may produce a number of responses including bioaccumulation of potentially lethal compounds and mortality of resident organisms.

As an aid to projecting potential aquatic ecosystem effects from discharges of advanced fossil-fuel processing wastes and an aid to defining methods through which potential effects may be mitigated, the U.S. Environmental Protection Agency published in February 1980 the "Bibliography of Aquatic Ecosystem Effects, Analytical Methods and Treatment Technologies for Organic Compounds in Advanced Fossil-Fuel Processing Effluents" (Research and Development Series Report EPA-600/3-80-026). That bibliography contained 1314 citations indexed by chemicals, keywords, taxa and authors. The citations were obtained exclusively from computerized bibliography data bases and covered the period ca. 1970-1977. To update and expand the original volume, the following bibliography presents 1135 additional citations compiled during our continuing research with aqueous wastes from advanced fossil-fuel processing technologies. The citations cover a period before, during and after the period of the first volume and include citations not identified during those computerized bibliography searches.

In producing this second volume of the bibliography, those citations we identified as potentially useful were entered into computerized storage at the University of Wyoming. These citations were subsequently edited, sorted and indexed using programs developed for the first volume. The chemical index was prepared using the same list of indexing terms used for the first volume. That list contains nearly 500 organic compounds identified as constituents of fossil fuels and fossil-fuel processing effluents; for each compound, synonymous chemical terms are included. The list of terms used for producing the keyword and taxonomic indexes are essentially the same as used for the first volume; however, several terms have been added to each list. Like the first bibliography volume, this volume emphasizes information pertinent to organic compounds in freshwater environments, while also including selected literature on terrestrial and marine systems.

GUIDE TO THE BIBLIOGRAPHY

This bibliography is arranged in five sections: the chemical index, the keyword index, the taxa index, the author index and the citations. Following each term in the indexes are numbers corresponding to the numbers of the citations in which the term appears. The chemical index contains most compounds included in the searches. Selected chemical synonyms are cross-referenced to the principal entry, generally that spelling which was used by the source reference where the compound was identified. Only chemical names for those compounds for which citations were found are listed; the complete list of compounds used is presented in the first bibliographic volume.

The keyword index contains terms used in searching the chemical compounds as well as additional useful terms. As with the chemical index, similar terms are referenced to a principal term (e.g., "decomposition see degradation" and "bioassays see toxicology, bioassays").

Both general and specific taxonomic groups are alphabetically compiled in the taxa index. General taxonomic groups (e.g.,bacteria, crustaceans, fish, etc.) are followed by the list of citation numbers having information on these groups, while specific taxonomic groups (e.g.,coliform, Pseudomonas, Daphnia, etc.) present a listing of citations having information on these more limited groups. In many cases the citations for several lower taxonomic classifications are grouped under a higher classificational category; in such cases the interested user is referred to the appropriate classification to obtain the citations (e.g.,"bluegill see Fish, Centrarchidae").

The author index includes all authors listed in the citations. Due to variations in the way individuals are listed in various publications, authors may have more than one entry in the index (e.g., "Smith J." and "Smith J.D.").

The citations are compiled alphabetically by lead author. Each citation is preceded by a number on which the indexing is based. In general, following the citation number is the author(s), work location, publication year, publication title (translated title if a foreign language title is present), publication source or other availability information, language of the publication and keywords. A two-letter paragraph label (e.g., AU) precedes each type of information included in the citation. The type of information varies according to citation but the formats can be divided into two groups: (1) those from journals, books, and reports; and (2) those from the National Technical Infromation Service (NTIS, Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161). A brief presentation follows which explains what is included in each citation and the meaning of some of the codes used in these paragraphs.

JOURNAL, BOOK OR REPORT

< >	Bibliographic citation number.
AU	Author(s).
IN	Institution or organization name and address where the reported work was performed.
YR	Two-digit year in which the book was published, the publication containing the citation was published, the degree was granted, or the year the conference was held where the paper was presented.
TI	Title of the original document which may be edited; if a foreign title, the English translated title is presented.
TR	Foreign language title if TI is a translated title.
SO	Abbreviated journal title, volume, issue number and pagination; for conference papers, the title of the conference proceedings, pagination of the paper in the proceedings and the date of the conference; for theses, the source of the printed publication within which the thesis citation appears, the volume, issue, section and page are noted; for papers published in books, the editor(s), title of book, publisher and location, total pages in the book and pagination of the article; for documents, the document number which is used to locate the citation in the Governmant Documents section of libraries. In some instances an NTIS number is listed in addition to other above information to provide another source for the citation.
LG	Two- or three-letter code for language.
DE	Descriptors added to the references to denote subject content not adequately covered by the title.

NATIONAL TECHNICAL INFORMATION SERVICE DOCUMENTS

< >	Bibliographic citation number.
AU	Author(s).
IN	Institution where the research was performed and the report prepared (typically the organization with which the author is affiliated), followed by the sponsoring organization(s) and any cooperating organization(s).
YR	Two-digit year the report was written; however, sometimes (almost always on transactions and journal articles) this is some other date such as that of translation, issue or publication.
TI	Original title as written by the author(s) or the translated title.
NT	Contains information which describes the report type (e.g., a technical

report or a final report), translation source, periodical source, related reports, language of the report, etc.

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SO	N followed by the primary NTIS accession number for the report which should be used when ordering.

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